

# AMATEUR RADIO



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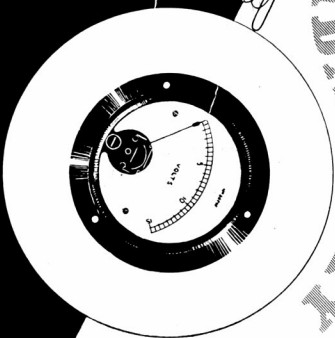
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# AMATEUR RADIO

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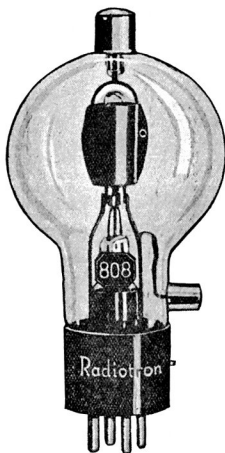
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## EDITORIAL

Whilst seated at the Fifth Test Match watching Bradman and McCabe in their memorable record partnership, we heard two men sitting behind us glorifying the cricketers of old. In fact, one would have thought that two schoolboys were batting instead of the greatest run-getter cricket has seen and the finest stroke maker in the world to-day. That night three of the younger Hams dropped into the shack, and after the usual talk of conditions and DX, the conversation drifted around to Radio in general. One of the visitors said that he would give anything to have been born ten years earlier, so that he could have lived through those great days when the short waves were just being "broken into." "How I envy you fellows who worked DX on 100 mx, who could work the world on 30, and who have grown up with radio," he said. This chap had worked some 300 stations in 38 countries in the last few months, so we asked him what he DID want from his Hobby. We told him of the little incident at the cricket during the afternoon, and asked him if he had ever heard of the old adage, "Distance lends enchantment to the scene."

We settled further into our chairs and pulled a little harder at our pipes, and, as the smoke curled upwards, endeavoured to show these Young Squirrels our point of view. For although we had lived through those grand old times, our earnest belief is that our Hobby can cram more genuine pleasure, amusement, comradeship, research and usefulness to the community into one hour to-day than we could spread out over twenty-four then. We emphasised the fact that it COULD, not that it does.

Admittedly, the scales were loaded in the old-timer's favour, because there was a chance of being the first Australian to EVER work U.S.A. or England or Europe, where now one could only be the first to do it on any new band. On the other hand, unless Lady Luck hands someone a good slice of her precious gift, it requires, if anything, more thought, preparation, knowledge, and experiment now to work a country on a new band now than it did then.

Take "Five" for example. It is only a matter of time before someone breaks through to England or America. We know the cycle is almost at the optimum, and we have a fair inkling of a connection between atmospheric conditions and "ultra high" DX. "Here is the chance of a lifetime; someone must get through; why shouldn't it be you?" we asked them. They demurred, they had never been on Five, they—we cut them short: "Can you give us one logical reason why a Ham shouldn't be striving every nerve on the ultra-highs whilst still carrying on his DX and local QSO's on the other bands? Gear need not be elaborate; with reasonable intelligence it is as easy to get an outfit going on Five as it is on Twenty; the back yard has yet to be designed that could not accommodate a Five-meter di-pole. Even a flat is no bar, as the gear is light, and can be made compact; it lends itself to portability and——" "Hey, steady on, your enthusiasm is running away with you," they objected, "in any case, we have heard that a hundred times." "Alright," we replied, "if you know the obvious advantages, why not get going? No, we know the answer, so we'll tell you. Ham Radio is so easy

to break into these days, the Handbook and kindred publications are so comprehensive, modern equipment is so easy to obtain and so efficient when going, that the present-day Ham is, in point of fact, born in the lap of luxury. Every angle of our Hobby is simplified and made easy, bar one, compared to what it was in the early days, the personal element alone is the same. The environment of Radio to-day breeds an indolent, drift-as-you-please attitude, where ten years ago a man had to be up and doing or his signal would not survive jumping his back fence!"

"Therefore you consider the Old-timers were made of sterner stuff?" one of them interrupted. "No, definitely not. The Ham of to-day is every bit as good a man, but being able to go a certain distance with little or no effort, he doesn't bother to spur himself to real endeavour. You envy the Old-timers because they achieved something, but there are opportunities staring you in the face to-day for achievement as great as theirs. The ultra-highs are your proving ground, and the time to start is NOW, or you may have to wait eleven years for the chance again. It is earnest, enthusiastic effort that is required, and we will guarantee you will have your reward in the feeling that you really are getting somewhere worth while. Think it over, and then let us have another yarn on the subject."

As they went out the door there was a thoughtful look on each of their faces, and if we have stimulated a "will to do" and a desire to get somewhere in them then we will feel the banner of Amateur Radio is passing on to worthy hands.

In drawing readers' attention to the technical article competition announced in this issue, we must again thank the New South Wales Division for such a tangible example of their support.

In the previous competition, for which a trophy was donated by the Council of that Division, the number of articles submitted showed a decided improvement.

We must have a continued supply of technical articles on the hook—members do not seem to realise this, or, if they do, they are quite prepared to leave it to the other fellow to write one.

The New South Wales Division realise our difficulties in this direction, and feel that by providing a trophy for the best article submitted, the incentive is given members to write articles and, at the same time, prove to all Divisions that they are giving the magazine all the support possible. The Editors appreciate their efforts—show your appreciation by sending in that technical article.

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### BOOK REVIEW.

The experience a ham gains after some time on the air often teaches him that "all that glitters is not gold," wherein the "glittering" comes from the plate of a boiling hot tube. Burning up watts that may or may not reach out further than the back fence is slowly becoming a thing of the past, and in its stead more attention is being paid to the actual radiator of that power; the antenna. Proof of this can be found in the rapidly growing number of VK and W hams who are going in for directional or controlled angle of radiation antennae.

To provide for the necessary dope on such systems and the means of feeding them, "RADIO," of California, has published a very valuable publication known as the "Radio Antenna Handbook." This has been on the market just a short time, and McGill's Agency, of Elizabeth Street, Melbourne, report that the booklet is being very well received indeed.

A review of the "Radio Antenna Handbook" shows that it suffers from very few minor defects. It may have been more helpful to refer to any one of the many newly named antennae per medium of a general index—whereas there is not one.

The handbook starts off well with a resume of antenna fundamentals and is followed by some advice on the choice of the antenna to be used.

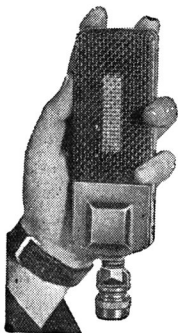
The following chapters are devoted to Methods of feeding antennae, Coupling to the transmitter, Harmonic antennae, Directive antennae, Receiving antennae, Special antennae, and finally some constructional details on masts and towers. In its 80 pages this handbook deals quite fully with all the latest designs of arrays and more especially, the manner of feeding them.

Page 5

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# Some Considerations in the Design of a Radio Frequency Amplifier

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With Acknowledgments to Eimac Radio Co.  
U.S.A.

In practically every instance the users of EIMAC tubes will wish to realise optimum efficiencies from the circuits in which these tubes are employed. Without going too deeply into the technical considerations we are setting forth a few suggestions that have proven helpful in many instances. The radio frequency amplifier can be divided into four parts for the convenience of illustration and discussion—1. The grid circuit. 2. The plate circuit. 3. Neutralizing. 4. Antenna coupling.

## The Grid Circuit.

The grid circuit is the control circuit. Very seldom does the stage furnishing the excitation supply an overabundance of power in order that we do not waste too much power in the transfer from the plate circuit of the driver to the grid circuit of the amplifier it is important that some consideration be given to the losses that may occur in the grid circuit. An independently tuned grid circuit coupled to the driver with a low impedance line is the most efficient method of power transfer. By the proper matching of the low impedance line to both the driver tank and the grid tank we find that it is possible for the grid circuit to assume the maximum voltage swing permissible by the supplied power regardless of the plate voltage of the driver stage. The use of a low impedance line prevents capacity transfer back to the driver and permits complete neutralization within the amplifier. The grid circuit tank condenser may have to withstand considerable voltage if the excitation power and bias voltage on the amplifier is high. In all but the most extreme cases a double spaced transmitting condenser will prove adequate. The condenser would preferably be split stator as it lends itself well to both push-pull amplifiers, if two tubes are used, or to grid neutralizing when only one tube is used. If a split-stator plate condenser is em-

ployed with a single tube the grid condenser can be single ended. The grid coil should be designed with an idea towards efficiency, so that it should not be too small or wound with too fine wire. The grid return for the bias should be tapped on the centre of the coil if a split-stator arrangement is used, or to the "cold" end of the coil if a single section condenser is employed. The use of an RF choke at either point is questionable, as the chokes now available usually have similar characteristics, and if a choke is employed in the plate circuit there is a possibility that the two chokes will resonate with each other, causing parasitic oscillations at low radio frequencies. In order that the grid circuit be properly adjusted it is absolutely necessary that a meter be employed either permanently or temporarily in order to determine the value of grid current and to properly adjust the circuit for maximum efficiencies. The grid circuit should always be adjusted for maximum grid current.

## The Plate Circuit.

The design of the plate circuit is probably the most important one in the amplifier if optimum results are to be expected. Considerable confusion has existed regarding the proper choice of capacity for the amplifier plate tank condenser. There apparently has been two distinct schools of thought, one leaning toward extremely low capacities, while the other leans just as far in the opposite direction. Any tank circuit, regardless of the inductance capacity ratio, would have infinite "Q" at resonance providing there was no resistance in the circuit. Where there is a finite value of resistance in the circuit it is found that the circuit with the least capacity will have the highest "Q" when unloaded, because the loss occasioned by the tank circuit resistance is a function of the circulating current. When we couple

useful resistance into the tank circuit we find that the low capacity tank circuit loses its "Q" at a faster rate than the high capacity circuit. If the coupling is carried beyond a certain point we find that the high capacity circuit would probably have more "Q" than the low capacity circuit. It has been determined that for optimum conditions of performance the value of "Q" should not go below a certain minimum. The "Q" of the tank circuit should be higher for phone operation than for telegraphy work. We note that for every value of plate load there is a certain minimum capacity that it is undesirable to go below. In order that the same capacity-inductance ratio be maintained we find that the size of the capacity varies directly with frequency. If we maintain a constant plate current it will be found that as we raise the plate voltage the value of coupled resistance becomes higher, making it possible to use a smaller size tuning capacity. Summarising, we find that the optimum value of capacity is determined by load, frequency, plate voltage and type of service. It is also undesirable to make the capacity any larger than necessary, as excessive circuit losses will result, due to the high value of circulating current. This type of loss makes itself apparent by excessive heating of the tank circuit.

The tank coil should be of low loss construction. Tubes operating at high plate voltages and lightly loaded require low values of tuning capacities so that losses occasioned by circulating currents are low. The low values of circulating currents makes the use of small sizes of copper tubing, or even of No. 10 wire, highly desirable, as losses occasioned by distributed capacities are less, with resulting higher overall efficiencies. It is desirable that the tank coil fasten directly to the tank condenser. If it is impractical to do this, make the connecting leads between the coil and condenser as short and as heavy as possible. The dimensions of the coil should be reasonably large, with approximately four inches as a minimum diameter in order to obtain the highest efficiencies.

### Neutralizing.

The comparatively low values of capacities that are used with tubes operating at high plate voltages and lightly loaded, makes the tank circuit

susceptible to outside influences. When operating a vacuum tube under such conditions it is absolutely imperative that neutralizing be accomplished in such a manner that practically the same values of capacity and inductance be present in the neutralizing branch as in the branch to be neutralized. To realise such a condition it is important that the node for the circuit to be neutralized occur at the electrical centre. There are two schemes for neutralization which are in general use. One employs a split-stator condenser in the plate circuit. The electrical centre is formed by the symmetrical capacity to ground realised by the use of a split-stator condenser. Neutralizing voltage is fed from one end of the plate tank coil to the grid of the tube through the neutralizing condenser. The grid condenser can be single ended. The second method uses a split-stator condenser in the grid circuit with the electrical centre formed by the condenser. Neutralizing voltage is fed from the opposite end of the grid tank to the plate of the tube through the neutralizing capacity. When tubes are operated in push-pull a combination of the two systems is employed. In all cases where care has been taken to make everything symmetrical and the leads to the capacities short, it will be found that the capacity of the neutralizing condenser is approximately equal to the tube capacity. It is important to note that the minimum capacity of the split-stator condenser to ground should be three to four times the capacity of the connected tube electrode to ground, in order that the condenser will have sufficient capacity to determine the electrical centre of the circuit.

### Antenna Coupling.

In order to operate an amplifier at its maximum efficiency it is important that the tank circuit, when tuned to resonance, represent a pure resistance into which the vacuum tube is to work. Standing waves on the transmission line will result in a change in power factor of the tank circuit, with the resulting increase of tube dissipation. Unless the standing waves are completely eliminated it is imperative that some sort of "buffer" arrangement be used between the tank circuit and the antenna. The "buffer" should consist of an impedance matching network which will correct the errors in

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the transmission line and reflect a pure resistance into the tank circuit. The proper loading of both sides of a push-pull tank circuit is another important consideration. Coupling to a two-wire transmission line should be effected symmetrically around the electrical centre of the tank coil. If only a single wire feed is used with a push-pull amplifier a low impedance line should couple the plate tank to a second tank to which the single wire feeder is connected. This second tank will allow the proper impedance matching as well as tend to eliminate undesirable harmonics.

#### Types of Amplifiers.

All the above considerations hold for all types of amplifiers regardless of their use. We find the real differentiation between the various amplifiers is in the amount of bias employed and the available excitation power. Different amounts of bias alter the performances to such an extent that the amplifier classifications are designated in terms of ratios of plate voltage to bias voltage. A class "B" amplifier is one in which the plate current is reduced practically to zero by the bias. This amplifier gives the maximum power gain with limited excitation powers. Over a good portion of the cycle the plate current varies directly with the grid voltage, so that this is the type of amplification used in radio frequency linear amplifiers where modulation has been effected in some low level stage.

A class "C" amplifier is one that is biased beyond the plate current cut-off point and is noted for the somewhat higher plate efficiencies obtained. Somewhat greater grid driving power is necessary so that the power gain is less with this type of amplifier. Where modulation is effected in the plate circuit of the amplifier the bias voltage should be great enough so that a condition of twice plate current cut-off is noted if 100 per cent. modulation is expected.

#### Tuning.

The grid circuit should be tuned to maximum grid current. The plate circuit should be tuned to resonance with plate voltage off by noting the maximum deflection of the RF meter used for neutralizing. The neutralizing condenser should be adjusted until the RF meter shows minimum deflection. The plate tank circuit should then be readjusted until the RF metre

## Concentric Line Feeders at High Frequencies

By E. H. Conklin, W9FM

Every year or two, someone calls our attention to the advantages of the concentric transmission line, but few appreciate these advantages particularly where the antenna is also to be used for receiving.

The dimensions of such lines are usually selected so that the surge impedance is around 65 to 100 ohms with the inside diameter of the outer conductor usually from three to four times the outside diameter of the inner conductor. Most of the loss is in the copper resistance of the inner conductor and the dielectric loss in the spacers. Price usually determines the size of the outer conductor, after which the proper size for the inner one is calculated for the lowest loss.

The loss in this type of line is not large, even at ultra-high frequencies where other low impedance lines, such as the twisted pair, are practically useless. The loss varies as the square root of the frequency. A three-eighths inch line built by Doolittle and Falknor, of Chicago, is said to have a loss of 0.8 db per 1000 feet at 1000 kc. At 100 mc. (3 meters), therefore, the loss in only 100 feet would be 0.8 db. A two inch line is available at twice the cost (but requires expensive factory-made bends) with a loss of only 0.14 db per thousand feet at 1000 kc. On the usual amateur high-frequency bands, the loss in moderate lengths of the line will not be appreciable.

It is possible to end-feed an antenna with a low impedance line, which is most convenient for verticals mounted high. Because the impedance at the end of an antenna is not infinite but is very roughly 3000 ohms (depending upon conductor size, insulators, etc.) a quarter-wave matching section can be used to match this to the approximately 75 ohms impedance of the line. The transformer can be a pair of wires or tubes so spaced that the calculated impedance, squared, equals  $75 \times 3000$ —the product of the antenna and line impedances. This works out

to be a little less than 500 ohms. This same stunt is called the "Johnson Q" when it is used to match a spaced line to the center of a doublet, in which case the matching transformer must have an impedance below 200 ohms, requiring close spacing or large tubing.

### Tuning.

Some care should be taken to cut the antenna to the correct length. The presence of standing waves in the feeder can normally be detected simply by measuring the current at both ends of the line, which should be the same. If the antenna is resonant at the operating frequency, the spacing of the conductors in the matching section can be varied to obtain proper match. The antenna power will, of course, be equal to the line current squared times the line impedance.

Coupling to the transmitter is quite simple. A few turns of wire near the final tank, close enough to load up to the proper input, will fill the bill. A "Collins Coupler" is not required.

### Advantages on 56 Mc.

A number of five meter stations have placed half-wave length antennas at the top of expensive towers in order to work greater dx without a beam. These same stations may be troubled with ignition interference when using the high antenna for receiving because of feeder pick-up. The grounded concentric line, forming a well-shielded circuit, would eliminate pick-up below the antenna. The cost of 25/- a foot for the small three-eighths inch line, which will handle 5 kw unmodulated cw or 1 kw phone, does seem large but the advantages of the high and expensive tower are not really enjoyed until the full benefits are available for receiving.

The value of a concentric line is illustrated by the experiences of the Wheaton, Illinois, police on 40.1 mc. With the receiver at the police station, an automobile running in the block

(Continued on page 14)



## W8ZY's 96-Footer

(By E. H. Conklin, W9FM.)

A year ago we called upon Karl Duerk, W8ZY, and became interested in his 39-pound duralumin mast, which, placed upon the house, reaches up to the 96-foot level, and acts as an all-band antenna. Recently we made a special trip to Defiance, Ohio, just to take another look, and obtain a description, which is presented below. If you are interested in its operation rather than the construction, skip over the following details:—

### Material.

The bill of material calls for 70 feet of 0.120 inch wall, 40,000 pound tensile strength "dural" tubing. The wall is slightly less than  $\frac{1}{8}$  inch, and therefore tubing in quarter-inch steps will telescope together. The five 14-foot lengths have the following inside diameters:—2", 1 $\frac{1}{2}$ ", 1 $\frac{1}{4}$ ", 1 $\frac{1}{2}$ " and 1". The total weight without the guy wires is 39 pounds, and can literally be lifted single-handed. A telephone call to the Alumin Company revealed that tubing of this strength is relatively inexpensive compared with heat-treated materials. It is described as "52 S.H." In quantities less than 25 pounds of each size, the cost runs around 61 cents and 62 cents a pound for these diameters. The duralumin therefore will run to about 25.00 dollars.

The mast is supported on a large multi-skirt insulator (who said "pop Bottle?"), because high voltage will appear at the bottom. Good insulators should be used where the guy wires connect to the mast, because these must handle the strain as well as the voltage. Duerk uses the twelve-inch Johnson type. Other guy wire insulators can be the inexpensive "eggs" which involve looping the wire through so that a broken insulator doesn't let the mast down on somebody's head. Number 12 galvanized iron wire—or copper-clad steel where smoke might cause corrosion—is used at the upper guying position, while only #16 is necessary for the lower guy wires.

The upper guy wires are attached to a pipe flange, which has had its threads turned out to slide on the

1 $\frac{1}{2}$ -inch section resting on the 1 $\frac{1}{2}$ -inch section (inside diameters). Fittings of this sort without internal threads are probably available also from brass supply or boat supply houses—or whoever supplied the rails before bars went modernistic.

The sections are bolted together with  $\frac{1}{2}$ -inch drill rod, threaded at the ends and cadmium plated. A single bolt at each joint is sufficient, because the outer tube is squeezed against the inner one sufficiently to remove the "shear" strain upon the bolt.

And, lastly—get a cork to plug the top to keep rain water out.

### Construction.

It is difficult to distinguish between the construction of the pole and the operation of raising it. The only real construction job is drilling four holes for the bolts. If this is done beforehand, the bottom two sections can be slipped together ten inches, and the bolt hole drilled through (see figure 1). The same overlap is used at the second and fourth joints. The third joint, however, carries the strain guys. In this case the overlap is made 2 $\frac{1}{2}$  feet long, and, in addition, a four-foot piece of the 1" section is slipped inside of the 1 $\frac{1}{2}$ " section to strengthen the joint.

The total length above the base insulator at W8ZY is just 60 feet, the visible length of each section beginning with the bottom being 14', 13' 2", 13' 2", 11' 6", and 8' 2". Originally the whole top section was used, the total length being 65 feet, but the top swayed around a little more than was thought safe with the upper guys 25 feet below the top. If the full half-wave length is desired on 7 mc., it might be better to start with a 20-foot section of the two-inch tubing, thus raising the upper guy wire position, keeping it twenty feet below the top.

If a vertical rod is pivoted at the base and is guyed two-thirds of the way up, it could vibrate mechanically with a "half-wave length" below the guys and a "quarter-wave length" above. By placing the second set of guys one-third of the way up, the

possible vibration is reduced to almost nothing. The top will weave about as much as two or three inches, but no serious bending has been observed.

The guy wires can be made ready. In the W8ZY mast, the upper guys are broken into 6½-foot lengths, the lower guys into 4½-foot lengths. They can be attached to the substantial insulators located just at the flange. Four guys at the upper position are recommended.

One way to support the high-tension insulator on a slanting roof is to make a box to fit over the peak, bottom side up, requiring no nails in the roof. This box can be large enough to bridge across two rafters in the roof. See

If you are going to put the pole on top of a peaked-roof house, a handy gadget is recommended. Duerk built up a little double platform from 2 x 8 planks and some 1 x ¼ inch iron bar (see Figure 5). The perforated strip used to support pipes from basement ceilings probably could have been used. The iron bar is bent to conform with the roof angle at the peak, and bolted at the ends to triangular pieces of the plank which support a narrow, horizontal platform on each side of the peak. If the mast is to be right at the edge of the roof, don't fix things so that the mast grows up through the centre of the platform unless you have arranged to take the platform apart to remove it. One dodge is to move one of the iron straps in from the end of the planks so that both straps will be on the same side of the mast.

Wood can be used in the construction of the platform in place of the strap iron, or two ladder-like arrangements can be built and bolted together so that one ladder goes down one side of the roof while the other, bolted to it at the top end, serves as a counterweight down the other side. (See

### Raising the Pole.

A scaffold was used the first time this mast was raised. When it was taken down, shortened, and replaced, the "handy roof gadget" was used. With men standing by the upper guys and two on the roof, the whole thing was lowered, rebuilt and raised in about an hour.

The first thing to do is to cork the top section and set it on end. Then the next section can be bolted below, working over the edge of the roof. The flange is then slipped on, and the

middle section is bolted on and passed up hand-over-hand. The fourth section and sway-guys are next attached—half-way between the strain guys and the bottom—followed by the bottom section. Some help will be needed from the guy wire attendants on the ground by way of keeping the pole vertical after the third section is attached.

While ordinarily a mast of this height would require numerous sets of guys and a large area over which to stretch the guy wires, the fact that the upper guys are only two-thirds of the way up reduces the space requirements. Duerk has one guy attached to the house only 30 feet from the base. The other three are fastened to convenient trees and posts from 30 to 50 feet from the base.

### The Feeder.

At W8ZY, the total length is now only 60 feet above the peak of the house, and therefore the feeder runs as a single wire for an additional six feet from the bottom of the pole before the second feeder starts. On most bands, the feeder is switched to a pair of condensers and a coil, the latter being link coupled to the proper transmitter. On ten metres there was a shortage in the condenser supply, so the coil was placed in the feeders without a tuning condenser, and the turns squeezed together until resonance was obtained. On 80 metres, a horizontal wire could have been attached to the second feeder, or the whole mast, plus feeder, could have been worked against ground, but Europeans could be raised just by tuning the feeders and antenna, allowing the feeders to become unbalanced.

### Operation.

Our first impression of the operation of this mast as an antenna was that it would be fine on 7 mc., but because it is a full wave length on 14 mc., the higher angle of radiation might reduce its effectiveness. We had visions of center-feeding it to get 2 db gain and concentrated low-angle radiation. However, the absorption of radiation from the bottom half may be greater than from the upper half, which is in the clear above houses and trees, so that the pattern may not be as unfavourable as might be expected. W8ZY does get out very well on the 14 mc. band, however, and gave us this illustration. —

A chap from Akron, Ohio, recently

moved to a rubber plantation in Liberia, and put up a rig to keep in touch with the family. He is using the call UN2A (14,404 kc. with a real signal!), and a beam pointed across the U.S.A. W8ZY has plenty of competition with other 1 k.w. rigs on 14,397 kc., yet UN2A says that other R9 signals cause no trouble, even when copying several hundred words of news from home—with two exceptions, W1LZ and W6CXW.

On ten metres, the pattern presumably has several lobes, including some at low angles. With 250 watts input to a T-55, W8ZY seems to work plenty of dx, with reasonably good reports.

On receiving, signal strength is better on all bands than on anything else that has been in use. On the highest frequencies, ignition noise is worse than on a horizontal doublet, but the better strength justifies the use of the single antenna for all purposes.

The field strength within the house is noticeable, making it necessary to use some by-pass condensers across lights. That would still happen, probably, if the mast supported the end of a low horizontal antenna. If a short pole is available in the yard, the mast could be mounted on that, away from the house.

No one is making claims that this antenna is better than stacked doublets, beams, etc. Yet it is up in the clear, where some power can be radiated above trees and houses, it can be used on several bands, and is not as unsightly as a pair of poles with a lot of guy wires all over the lot.

(Continued from page 14)

could make it impossible to hear the cars. An eight element bi-directional beam—two stacks of four elements—helped somewhat when the squad car was in line with the beam, but also brought in the New Rochelle, N.Y., station a bit too well on occasions. Jim Wilson, W9BUK and Charles Fetweis, W9KJW suggested placing the transmitter and receiver, remotely

controlled, at the base of the water tank, with a concentric line to the antenna high above. With this antenna cars directly below were some distance away, in the direction of least antenna pick-up, so ignition troubles practically disappeared. The fixed station was able to hear the squad cars anywhere in the city at any time.

### At Lower Frequencies.

When there is a vacant lot nearby, the "ham" usually cannot take advantage of the space. A concentric line along a fence or buried would make the vacant space available for an antenna. When this type of line is buried, moisture may collect in it, which can be blown out with dry air or kept out by filling the line with nitrogen under pressure.

Most of us object to untuned lines because of the usual requirement of a separate antenna for each band. Bruce, we understand, uses one of these lines on a diamond antenna operating on various frequencies over about a three-to-one ratio. So you see, it can be done.

### £1 1s. ARTICLE CONTEST.

The New South Wales Division feels that the prize it offered some months ago for the best technical article, over a period of four months, advanced the standard of articles to a considerable extent, and in order to further the standard a step more, has offered another prize of £1 1s. This generous donation will be awarded on the same basis as before, that is, for the best all-round contribution received and published before the end of August. The editors of "A.R." will be the sole judges, and their findings will be binding. Here is an opportunity for all, and is by way of a change from DX contests, which have come to an end for a while. The articles can be theoretical or practical, and circuit diagrams, plus photos, will carry much weight. Post contributions to

THE EDITOR,  
Box 2611, G.P.O., Melbourne.

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## 28 and 56 M.C. Notes

(By A. Pritchard, VK3CP.)

The W-CW contest is over, and oh!—did they come thru on 10! There was an absolute harvest for those VK's who could be on during the day time. W's 1, 2, 3 started getting thru at 6.15 a.m., and W6 and 7 faded out at 3 p.m.—many phones as late as 4 p.m. W6CKR phone carrier audible at 5.30 p.m. VK's 6SA, 5KO, 4AP, 2LZ (r 6 hr), 2PN, 3MR, 3BQ, 3CP, 3YP furnished most of the VK's for the States. VK3iW, 3VB, 3UW, 3GU were also on for a short time. On the 8th March, W1TW was r6 at 12.15 p.m., and 3YP qso W2TP on phone at 1.30 p.m. The Canadians were more plentiful on 10 than 20 mx. VE5QP, 4PH, 3ER, 2KA were probably the best. K7PQ CW r8, K7FBE phone r7, are easy contacts. From Central America, XE1AG, XE1AY, XE1LM, XE1AM, and phone from VP5PZ are good from 9 a.m. till 12 noon. W1SZ, with a Rhombic ant., was r9 at 8 a.m. on the only dead morning, the 15th March. Last year, during the contest, W1's were the most scarce. This year W1TW, 1ZZ, 1CUH, 1ME, 1BPN, 1AV, 1iCA, 1TS, 1Xi, 1HOU, 1ZB, 1ANA—cw—were all bumper sigs. W3EUQ, 4AH, 2DZA, 8DYE, 5EHM—using diamond—W7RH, W6JN, 7BYW were all r9 for hours at a time. VE4PH, 4SH, at 7 a.m. and 1.30 p.m. respectively, were fb. As we expected, the Europeans were at their best again during our evenings. On Sunday, 28th February, VK3BQ had a fine bag (!), and worked more than a dozen. D3BMP at 5.30 p.m., and YL2CG at 11 p.m., marked the beginning and ending of the fbKX. G2AO, G6DT, FM8AD, ON4VW, F8LX, D4XJN, G2PL, U9AW, G5QY were all r8 between 10 and 11 p.m. Also ZE1JU was pounding in at 10.15, and was qso by 3BQ. YP, CP at that strange time for South Africa. On the 25th February, phone was put over to HK1JB, which completed the 10 mx phone WAC hr at 3CP, and the next day all continents were fb—1.30 p.m. HK1JB, 1.45 p.m. VE5QP, 6.20 p.m. G2PL, 6.30 p.m. ZE1JJ, 6.45 p.m. J2CF, and 7 p.m. VK3BQ, qso hr at 3CP

for WAC in 5½ hours. On the 5th March OE3AH, YM4AA, PAoAZ were all OK at midnight, but faded out at 12.30 a.m. VK3XP has been rebuilding his modulator, 27-2a5 class ab 42, giving over 20 watts audio. VK3BQ has the Rhombic up, and is getting good reports. Each leg is 2½ waves long on 10. VK2GU has dozens of contacts on phone each day with the States, and Arch. is well known for his fb phone. W6iTH has his 5 mx rig nearly finished. This consists of 6L6, 807 doub. 35T, and 100TH 400 watts tone modulated. The ant. is vertical WID, 3 refl. and 5 directors, set on Aust. VK3CZ has enough room to put up a diamond ant. (over the tennis court), and is all eyes on Max's ant. for results, etc. Arthur has built a reg. doub. with a '210, from 20 to 10 mx; the outut gives at least 30 mills grid C in the 800's PP final. VK3YP has completely rebuilt his mod., 57.57 2a3-2a3PP, class ab 6L6G. Patto qso'd 22 W's in an hour. All remarked on the quality and punch. Xtal mike does the job! VK3OC has qso 5 contin, and only wants Europe for WAC. Ray is making coils for his new super, so we'll hear him again on 10.

(By E. H. Conklin, W9FM.)  
56 Mc. Dx Again!

On 2nd December, Frank South, at W3AIR turned on his 28 mc. receiver shortly after noon, to run across W6DOB's signal calling "CQ 56 mc." This apparently was 28 mc. doubler leakage to the antenna. Frank had learned of his 56 mc. harmonic, so ran up the bias voltage to increase the second harmonic output from the 28 mc. transmitter (a pair of 830 B's), and raised W6DOB. Back he came with "ur r7 qsb r2—am copying u on 56 mc.—are you on five?" W6DOB attributed the ten meter output to the proximity of the 28 mc. antenna feeder and final tank coil. He mentioned having schedules with G5BY, LU1EP, XE1AY and VK4AP on 56 mc., and expressed regret that W3AIR was not listening on five metres to make it two-way. We believe that this QSO should be credited as the first for W3-W6 on 56 mc.

On 22nd November, between 10:00 and 11:00 G.m.t., both G2HG and BRS250 heard CN8MQ on 56 mc. On seven days between 13th and 28th October, ZT6K, in South Africa, heard the sound portion of television broadcasts on 7 metres from Alexandra Palace, London. On 20th October, he heard the 56 mc. harmonic of W6IRD calling ZS2P. The receiver at ZT6K consists of a battery model Pilot Wasp, regenerative detector, and two stages audio, with home-made coils for seven and five metres.

We feel that more U.S.A. stations could hear 56 mc. dx if ordinary regenerative receivers or good super-heterodynes were in use, capable of hearing code, or phone carriers. In December, a month of long skip distance, 28 mc. signals have occasionally been heard as close as 600 miles. A year ago W6DOB was heard at W3SI. Certainly the shorter skip this coming spring and summer should enable us to set up new records for long-distance five-metre work.

We have been looking about for stations which would volunteer to put automatically keyed five-metre code signals on the air more or less continuously. These could be straight c.w. where local interference would otherwise be created, but some tone modulation could be applied elsewhere so that non-oscillating receivers could hear the signal. With such "beacons" on the air regularly, the 56 mc. gang would definitely have something to listen for. This long distance work does not require beam antennas, and horizontal receiving antennas can probably be used to good advantage (if high) where local noise would interfere with a weak signal received on a vertical antenna.

The Oakland and Berkeley, California gang, we hear, is gradually shifting to crystal control—realising that a ten-watt crystal signal will out-perform fifty watts self excited.

## 28 Megacycles.

During November and December there has been some complaint about lower signal strength on ten-metre dx. Part of this may be the usual year-end slump of very long distance signals between points north of the equator, though some may be due to a larger number of signals and consequent QRM, particularly in the jam at 28 mc. flat.

To all except the west coast, Asians on ten metres are still news. Yet to W3AIR (phone, with a pair of 830 B's) who uses the beams described in the November issue of "Radio," they are just the evening entertainment. Frank sends us this list with frequencies, all worked except J2DC:—

J3FJ	approximately	28,450 k.c.
J2CB	"	28,080 "
J2IN	"	28,120 "
J2DC	"	28,220 "
J3FZ	"	28,300 "
J2IS	"	28,305 "
J3FK	"	28,350 "
J2CF	"	28,355 "
J2LU	"	28,090-28,400

If you have trouble finding J's, listen late afternoons and evenings from late January to April.

The beam for receiving not only helps signal strength when the stations can be heard on an ordinary antenna, but increases the number of days on which J's can be heard, and the length of time they come through. The matched feeder, of course, is a help. Recently we have been working out the patterns for stacked antenna systems, directional or not. We have about concluded that stacking horizontal antennas one above another gives gain without lowering the angle of radiation, although with vertical antennas both gain and low angle radiation result. The horizontal arrangement has an advantage on receiving, when the signal follows a somewhat higher angle of approach, and where local interference is to be reduced.

Every now and then we get word from one of the gang asking us to stress the need for the use of a proper (resonant) receiving antenna on 28 mc., and a feeder that gets the energy to the receiver.

New countries are represented, this month, by YT7MT on about 28,300 kc., reported by W3AIR; YR5OR, heard by ON4NC; and PK3ST, who has been working G's. Several of our readers have asked for frequencies of various dx stations, particularly the "hard" ones. We'll print them if you send them in.

## Station Reports.

British Report, via G2YL.—Conditions during November were very similar to those of October, but showed a decline toward the end of the month, and the band sometimes went "dead" as early as 17.00 G.m.t. Australians and New Zealanders were more numer-

ous than before, but the latter were usually only audible for a short period around 08.15 G.m.t., and VK's are now often stronger at mid-day than earlier. Activity in Asia is gradually increasing, and new stations heard on the band in November include VU2AM, PK3ST, VS6AS, J2CB, J2CE, and J3DC, but J's, like ZL's, are getting rather scarce now. VU2AU and VS6AH are probably the most consistent stations, the latter's phone being R7 in England at times. African 28 mc. stations continued to get through well, and their numbers were swelled by FT4AG, SU1CH, SU1SG and ZE1JR. ZS1H was audible at all hours of the day, and it is rumoured that his 28 mc. Contest score is now in the neighbourhood of 130,000 points! South and Central Americans were heard spasmodically, but there are still only a few active stations. They include CP1AC, K5AY, LU1EP, LU9AX, OA4J, PY1BR and VP2AT. All districts of U.S.A. and VE1, 2, 3 and 4 were heard during the month; occasionally it seemed as if the usual occupants of the 14 mc. phone band had emigrated *en bloc* to 28 mc. W6 stations have been as good as ever, but for some reason W7's have become scarce. European signals were considerably louder and more numerous than at the same time last year, the most consistent countries being the comparatively distant ones, Russia, Finland, Latvia, Roumania and Jugoslavia. New G stations appear on the band almost daily, and the number now active must be approaching the 100 mark. A noteworthy feature this winter is the frequent reception of "distant" G's at about R3-4. G6DH has added considerably to his contest score during November by working 22 different Oceanic, 7 Asiatic, 15 African, 20 European, 5 South American, and 207 North American stations. On 22nd November he worked all continents—VS6, three VK's, LU, ZU, OH and W2 in just over 2½ hours, and apart from the Asiatic contact was W.A.C. in 1½ hours! G6YL has made W.A.C. and W.B.E. twice since 21st October, and heard 30 different countries worked with 6 to 10 watts input include VK, VS6, U9, ZS, ZE, FB, LU and PY. She suggests that dx stations, even if they prefer to transmit at the low frequency end, should sometimes tune their receivers from the high fre-

quency end after a CQ. G6RH worked seven W6's in consecutive QSO's on 28th November, 17.15-19.00 G.m.t.: W6IOJ, W6LEE, W6GRL, W6JNR, W6JJU, W6NEP, W6EYC. Conditions were very poor in England on Sunday, 29th November; African and South American were the only continents heard.

ON4NC.—The rare continent in October was South America. Asia in the mornings with J, VS6 and U9. Heard a rare one, TI2EA. ZL and VK at about 9 a.m. ZS1H still comes through, weaker in evenings, but often QRM'd by U.S.A. stations. W stations, all districts, begin to get over at about 13.00 G.m.t. West Coast a little later in the afternoon. On the whole, conditions fine in October.

W9ALV.—Work here week-ends during the past month included G6OZ and OK2HX on 20th October; D4GFF, HAF8C, OE1FH, G5QY and OK2RM on 1st November; VP2AT on the 8th; D4QET, D4DMN, and SM7YA on the 15th; and G2WO and J2IN on the 22nd. Not much doing on the band from then to 22nd December, with signal level down. Expect a pick-up in conditions in February.

W9DSR.—Deserves mention, says W6ITH, for R8-9 signals on phone, using only 5 watts to a type '19 tube in his final. Antenna is Johnson-Q fed. Uses a wind-charger, storage batteries and dynamotor.

W6ITH.—During Sweepstakes Contest in November, worked 111 stations on ten-metre phone, and had replies from K7PQ, ZL1CD, LU9AX and HI7G. VK2GU's new frequency is 28,120 kc. with a very nice phone signal about dinner time, working up to a dozen fellows every evening. He goes to work at noon, so can spend his mornings on the air. VK2YP and VK7KV are heard infrequently, but well. VK4WH, at Longreach, in the middle of Queensland, is using 12 watts to a single '10 feeding a Reinartz beam (see "Antenna Handbook"), and working Europe quite often. Australians hear FM8AA occasionally. ZE1JR comes in well on 28,e90; J3FZ on 28,285 fairly well with good English; LU9AX occasionally on about 28,040. Worked ZU6P at 8:00 a.m. P.s.t., and received 27 letters and cards from SWL's in England on this one QSO. "Of course, all the above is on phone."

(Continued on page 28)

## R.A.A.F. Wireless Reserve Notes

Officer Commanding: Flying Officer R. H. Cunningham, 397 High Street, Glen Iris, S.E.6, Victoria (VK3ML).

### District Commanders—

Second District, N.S.W.—A. G. Henry, Clareville Avenue, Sandringham (VK2ZK).

Seventh District, Tasmania—R. Cannon, Goldie Street, Wynyard (VK7RC).

Third District, Victoria—Pilot Officer V. E. Marshall, 3 Myrtle Avenue, Kew (VK3UK).

Fourth District, Queensland—A. E. Walz, Sandgate Road, Nundah (VK4AW).

Fifth District, South Australia—F. M. Gray, 52 Ormond Grove, Toorak Gardens (VK5SU).

Sixth District, West Australia—J. Mead, 111 Gerrard St., East Victoria Park, W.A. (VK6LJ).

### Federal Notes.

The recent cyclone at Darwin, which caused much damage and loss of life, should be a fair enough warning of what may happen at any other place at any unforewarned time. Failure of communications and domestic services are serious items in such cases, and if one, the former, with which we are concerned, can be provided, then a most valuable service can be rendered to the community. Radio must be looked to to provide the means of communication when line-connected services fail. When radio enters the picture one must have two essentials—firstly, the gear, and secondly, the operator and organisation. The matter of portable transmitters and receivers that will operate over a period of a few weeks independent of commercial power supplies cannot be taken too lightly. It is very clear that this organisation must be fitted to cope with any emergencies in such a way that a station may be erected at a moment's notice without having to design and build apparatus. One may even go as far as to say that a reserve station is NOT complete without emergency gear, and an appeal is earnestly made to all to immediately check over the spare gear available and construct something that will possibly mean the saving of lives and property.

The primary consideration is, of course, the power supply. This has been gone into by members who have already built portable stations, and the vibrator system operated from a six-volt accumulator appears to be

the most satisfactory to date. Power is not an essential IF good design and components are used. As a suggestion by one who has tried it, a simple tri-tet 6L6 crystal oscillator with 2 to 5 watts input will suffice. In about one month's time we will stage a field day in the Reserve for all equipped with emergency gear, and prove that the organisation is as strong and efficient as we claim it to be.

### 3rd DISTRICT.

(By 3Z1—VK3UK.)

An interesting test of the progress of training was had this month when a cypher message was put in the weekly Broadcast with the instruction that it was to be decyphered before any Sectional training was proceeded with. The cypher message was an instruction to forward a weather report to section leaders for relay to 3Z1, assuming that a weather chart of Victoria was required urgently. Excellent time was made by VMC2 and VMC4, for their section leaders were ready with the reports 53 minutes after the forwarding of the message. Considering section leaders had to call their section roll, make certain each member had the message correctly, each member had to decypher it, make up a weather report and forward in turn to the section leader, the time was an indication of the efficiency and ability of the sections.

We had unexpected visits from two country members this month. 3F2 was down for a few days, and had time to come out to 3Z1 for the weekly schedule on Sunday.

(Continued on page 28)

## Federal and Victorian QSL Bureau

VK3RJ, Qsl Manager.



The D.A.S.D. states that the German Broadcasting System "well reminds the merits of Amateurs in the development of short wave radio" and lends its voice for the benefit of the "great international bona-fide Amateur idea." Amateur broadcasts are made from time to time on 9560, 15200, 15280 and 17760 Kc.

W. T. Edwards, Principal of the Tifton High School, Tifton, Ga., U.S.A., wishes to know the Sydney Amateur who called CQ at 4.11 p.m. on Sunday, January 31st!!! Who was it? Hi!

The Secretary of the N.V.I.R. points out with "utmost stress" that the only Qsl Bureau address for PA is Box 400, Rotterdam.

We congratulate Edgar Sebire, VK-ERS, of Wandin, Vic., winner of the receiving section of the last VK-ZL international test on his achievement. A matter for further

congratulation is Edgar's venture into the matrimonial sphere. Good luck, Edgar. We trust your reports will always be RST 589 and no QRM.

The Hon. Secretary of "The World Friendship Society of Radio Amateurs" solicits members for the society. Any amateur who will promise "to make such use of Amateur radio as to promote international friendships and who will never voluntarily permit his station to be used as the tool of selfish nationalistic interests and who will strive to promote world peace," is eligible for membership, and should communicate with G6AQ.

Cards are on hand at the Bureau, 23 Landale Street, Box Hill, for the following:—

VK3-AD, AH, AM, AP, AX, AT, BS, BK, BL, BV, CA, CD, CV, DJ, DR, DS, DQ, EM, EW, EX, FJ, FK, FG, FM, FN, FS, GB, GE, GO, IL, JC, JM, JZ, KA, KG, KE, KK, KQ, KO, KM, LL, LP, LT, NB, NG, NT, NU, OI, OU, PA, PG, PH, PS, QK, RM, RL, RQ, RT, RW, SA, SM, SO, TG, UN, UF, VB, WL, XD, XG, XK, XS, XU, XW, YG, YL, ZC, ZF, ZG, ZW, Ballarat, Howard, Hibberd, Evans, Clark, Ryan.

## 6L6's in Glass

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## Divisional Notes

### CANDID COMMUNICATION TO OUR VALUED CORRESPONDENTS.

From VK3RX.

What I am going to mention in this open letter must not be taken as being directed personally to any one, but is the result of some six or eight months editing of these Divisional Notes.

Several pages of the total number received generally have to be re-written because of the too free use of abbreviations, and to make them sufficiently readable for the linotyper to set up. A little punctuation and capital letters now and then, where needed, would make things easier.

Please double space all typewritten notes if you can remember it, and, of course, one side only.

Now for a few "don'ts":—

DON'T use "es" for "and." "es" is the Morse abbreviation for "&," and should not be written.

DON'T write the Greek letter "lambda" for metres or wavelength.

DON'T write "wid" and "fer" instead of "with" and "for."

When mentioning calls, don't write V.K.3. RX., but put "VK3RX."

DON'T write more than we usually publish each issue. A glance over the back issues will show you. If you usually write a thousand words, and 500 is published, prune it a bit yourself before you send it to the editor, to arrive here before the 18th of the month. It goes to press the following day, hail, rain, or Sunday notwithstanding.

## 1937 Convention

Saturday, January 30th, was an eventful day in the annals of the W.I.A., as it ushered in the commencement of another year. The venue was Sydney, and the delegates representing the various divisions were:—W. Moore (Federal President), Don Knock (Tasmania), Beatson (Queensland), Barbier, (South Australia), Bischoff (West Australia), Ryan (New South Wales), Thompson (Victoria), P. Adams (Federal Vice-President), and Harry Caldecott (Federal Secretary). Mr. Wilson, whose ZL call sign I have forgotten, was invited to be present, as representing N.Z.A.R.T. A fairly lengthy agenda was presented for the attention of delegates, which fortunately were in the main non-contentious. One very outstanding fact which the convention proved was that each representative preserved a very

open mind on all questions, and approached the various problems with only one thought—the good of the W.I.A. and the "ham" game. State jealousies, if such a thing exists, were conspicuously absent. There is no necessity to go fully into the various questions here, as no doubt each division will receive a full official report in due course; suffice it to say that the whole paper was satisfactorily disposed of. The New South Wales division gave a dinner at the Dungowan Cafe on Saturday night, at which a very large gathering of "hams" were present. Among the many guests were representatives of the Wireless Branch, Press, I.R.E., New South Wales Radio Clubs, and visiting delegates. A very comprehensive toast list was duly honoured and replied to. It had been the intention to change the location of

Federal Headquarters to Melbourne for the 1937-39 period, but in view of the coming Sesqui-Centenary of New South Wales next year it was considered advisable to leave H.Q. in New South Wales. The next Convention will probably be put back from the usual January date until Easter of 1938 to coincide with the big "doings" in Sydney. In this particular regard, it would perhaps be advantageous to all concerned if the conventions were at all times held at Easter, as the usual Foundation Day week-end is really far too short, having regard to the distances delegates have to travel from the various divisions. The final act was the appointment of officers, and delegates were quite satisfied that the retiring officials had done a thoroughly good job of work, and they were re-appointed. The thanks of all delegates are due to the VK'2 who so generously and lavishly entertained them, and to the various organisations for their kindness in placing their plants at our disposal for inspection.

## N.S.W. Division

The Annual Meeting of the N.S.W. Division was held on 18th March, some 50 members attending.

The Secretary's report for the year was presented, and duly accepted, and without a doubt this Division is in an excellent position from both a financial and membership viewpoint.

A vote of thanks was passed for the work done by Messrs. Adams, 2JX, and Moore, 2HZ, on the State Council, the motion being carried in the usual manner. Both 2JX and 2HZ were not standing for re-election, as they were holding positions in Federal Executive, and the dual role, Federal and State, in their opinion, could not be successfully carried on.

5MZ and 2YE were welcomed as visitors, and new members were EX3OS and 2ADZ, ex ZL1JW.

The ballot for the election of officers for 1937-1938 was closed, and ZHZ and 2YC were elected as scrutineers.

The ballot resulted as follows:—H. Peterson (VK2HP), President (unopposed); F. M. Goyen (VK2UX), City Vice-president; O. C. Chapman (VK2OC), Country Vice-president;

W. G. Ryan (VK2TI), Secretary (unopposed); W. McElrea (VK2UV), Assistant Secretary; R. A. Priddle (VK2RA), Publicity Officer. Council—J. Moyle (VK2JU), D. B. Knock (VK2NO), M. Meyers (VK2VN), J. Innell (VK2ZR), H. W. S. Caldecott (VK2DA).

K. J. Burnett, Esq. (VK2BJ), delivered an interesting lecture on "Forms of Frequency Stability," and was extremely well received.

The President, H. P. Peterson, in closing the Annual Meeting, thanked all members, and especially the council, for their support during the past year, and hoped that the same support would be afforded during the ensuing one.

## ZONE 5 NOTES.

(By VK2LG.)

Beru Test now over, and WVE in full swing. The W stations rather patchy to contact on 20 c, but fair on 40 c. Believe a few on 10 c easy to raise.

Hilton Dixon old QD came off his mo'bike, and now in hospital, progressing slowly.

QE working the Europeans in fine style in BERU., also qso'd his first MX.

OJ still get work, but only occasionally. Heard on fone on 20 is sounds FB.

EU is building Xtal rig, and soon be on 20 with fone.

Our new ham AFD was in 11M on a job. IG rig playing up. Superhet working well.

Qso'd HPIA Sunday afternoon.

As usual, no news from the rest of this zone.

## AMATEUR AND SHORT WAVE EXHIBITION.

The organisation of the W.I.A.'s Amateur and Short Wave Exhibition is progressing, and the final layout of States, etc., is being arranged.

In view of the lack of space after everyone had been fitted into the last exhibition, it was decided to hold this effort in the Sydney Town Hall (the lower hall), and the dates from 3rd May to 8th May.

A preview at this early stage shows that there should be an extremely fine amount of gear showing. The prize list should be very similar to last year, and many prizes will be worth competing for.

The exhibition will again be opened from America, and this time Professor Woodruff, President both of the I.A.R.U. and A.R.R.L., will do the job.

## Amateur Radio

The show should definitely be the best amateur show ever shown in Sydney, and will give the experimenters a chance of revealing to the general public their work and worth.

### NORTH SUBURBAN RADIO CLUB'S REUNION.

(Affiliated with W.I.A.)

An extremely successful Club reunion was that held by the above Club at Chatswood on 16th March.

It was the Club's first birthday, and some 50 members and guests turned up in terrible weather to celebrate the event.

The Senior Radio Inspector, Mr. Crawford, in replying to the toast "P.M.G. Department," expressed the hope that the Club would prosper, as an organisation of such nature was of value to the Amateur movement.

The Chairman and President, Mr. Burnett (2BJ), donated a cup for the best ultra-high-frequency effort amongst Club members. VK2HL (H. Hapthorne) was the winner, and the

cup was presented to him by Mr. Crawford.

The outcome of the W.I.A. Field Day on 5 mx was discussed by Mr. Knock (VK2NO), who read a letter from 2ZC, Newcastle, who said that both 2NO and 2EM were heard near Newcastle during the Field Day.

At the conclusion of the celebration the various club delegates drew lots for their stall positions in the forthcoming W.I.A. Exhibition.

The following were represented at the reunion W.I.A. Federal, W.I.A. State, and Manly, Zero Beat, Waverley, and Lakemba Radio Club.

### LAKEMBA RADIO CLUB—VK2LR.

(Affiliated with the W.I.A.)

(By 2DL.)

The 7th annual reunion of the above Club will be held at the club rooms, Sunrise Hall, Canterbury Station, on 20th April. Admittance will be by invitation card, but an open invitation is extended to any interstate visitor interested who may be in Sydney at

To ensure insertion all copy must be in the hands of the Editor not later than the 18th of the month preceding publication.

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Our 1937

## Illustrated Catalogue

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the time.

Two club DX contests were conducted recently, the first being for the VK2UU Cup, which was won by 2AS. The Slade Cup was won the second time in succession by VK2KS, who managed to abandon his motor bike and other attractions for two week-ends, and worked some really good DX.

2OD, 2ABT, and 2DL recently conducted 5-metre tests from Government House, Sutton Forest, but were unsuccessful in contacting Sydney.

Since 2UC has moved to Lismore, 500 miles north of Sydney, 2MH and 2UB have been holding fairly regular skeds at the week-ends. 2UC reports that DX is not so good as at his former location at Marrickville.

Len. Worrall, now 4XM, is on 20-metre telephony at present, and is anxious to contact some of the VK2 hams. At various times 4XM puts a very strong signal into Sydney from Cairns.

## Ultra High-Frequency Section.

(By VK2VN.)

During the past few weeks two Field Days have been conducted by the section.

The first one was held on 24th January, when Mr. J. Moyle, 2JU, accompanied by 2HZ and myself, took a portable to Mt. Elliot, 40 miles airline north of Sydney. The location was reached by 11 a.m., and it was not long before the gear was in operation.

The first aerial tried was two horizontal half waves in phase, with stub and twisted pair feeders. Although this arrangement had worked well in Sydney beforehand, it was definitely not a success. A change was made to a vertical doublet, and contact was immediately established with 2NO, when signals were R8 both ends.

2LZ was heard from early in the morning continuously at R8, but, unfortunately, although Con was on all day for our benefit, contact was not established until late in the afternoon. 2XK, at Maroubra, was also qsoed, while 2OD and 2AZ were among other stations heard rather weakly.

Sunday, 7th March, was set aside for the biggest 5MX Field Day ever to be held in this State, but owing to inclement weather it had to be postponed until the following week.

14th March turned out to be a beautiful sunny morning after almost

a week of continuous rain, and shortly after 8 a.m. six mobile stations were on the way to the selected gras., two from Newcastle and four from Sydney.

A listening period was reserved between 12 noon and 2 p.m., and ten stations transmitted for ten-minute periods in a pre-determined order, the remaining 20 minutes being taken up by other Sydney stations.

Official stations and their locations were as follow:—2W1, Control Station, Kurrajong Heights; 2BP, Hazelbrook; 2JU, The Gib, at Bowral; 2LZ and 2NO, Sydney; 2OD, Hurlstone Park; 2TX, Norah Head; 2UV, Hawkesbury Look-out; and 2ZC, Mt. Sugarloaf, near Newcastle.

Complete results are not yet to hand, but will be given in detail in next month's issue.

Records have been both created and broken, possibly the longest distance contact being between 2JU and 2WI, but this is eclipsed by log forwarded by 2ZC, who reported hearing 2NO and other Sydney stations at Mt. Sugarloaf.

We take this opportunity of thanking all stations participating for support afforded the section in conducting the test, for we realise that its success lay in the hands of those co-operating.

## Victorian Division

(By VK3DP.)

By the number of VK5 hams present at the February meeting of this section, it would appear that they are trying to dodge the Test match. They were VK5JT (VKZ), VK5MY, and VK5LG. All spoke on the conditions and doings over there, particularly 5LG, who gave rather a fine talk on the mining operations carried on by the B.H.P. at Iron Knob (Mount Morgan), where he is employed. Arrangements were made to show the visitors over some of the shacks before leaving for home. 6YL was again a welcome visitor, and I am told on good authority that this YL will be here for some time, having obtained a position with a radio firm here. VK3 is sure the place to catch 'em and hold 'em! Best of luck, 6YL, and hope to see that call changed to VK3 shortly.

The auction sale that was to have taken place was sure a wash-out! Apparently the junk gear is too ancient to sell. It is to be held over until the March meeting. I think it would be a very stout idea to bring something along, junk or otherwise, and set the ball rolling.

Most chaps are pruning up their rigs for the B.E.R.U. test. The new rules will keep down high scoring in VK this year, but the test should prove very interesting for all that. "Snow" 3MR is trying very hard for the senior section, and we all wish him luck.

The only report from our Council representative was on the censoring of the items for the Convention.

The American visitors certainly had a swell time during their stay here, and were shown the hospitality of the W.I.A., the Key Section in particular. The evening before their departure the Coburg gang gave them a little house warming party. We first had a look round 3YO's shack, where Mrs. YO had some eats and drinks waiting. After cleaning out the house we moved on to 3MR's milk farm. "Snow" had a sked with

6SA for 6YL. After an exchange of greetings "Snow" brought to light more eats and drinks. He was very anxious for us to sample the Campbell milk, so brought the cow to the shack door and milked her on the spot. (So they told me.) After wrecking this shack, the mob moved over to give 3DP's shack the once over, later moving over to 3OC, where Mrs. OC had a fine supper laid out for us. All present had a thoroughly enjoyable time. I am convinced that all hams have R max thirsts by the way they were knocking tops off bottles. "Snow" and the W's had an argument on signal directions, and—you know what "Snow" is. Hi! This racket continued until 2 a.m., when good-byes were said and all went their various ways, having had a swell nite.

3KE.—Heard lately on 40mx fone. Is sure fb. Been having great trouble dodging QRM from 3RW.

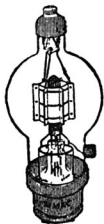
3FW.—Building Xtal rig. Otherwise very quiet, using TPTC at present.

3YR.—Still silent.

3RJ.—Back to earth in the Maryborough and Bairnsdale districts

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3QR.—Building new short wave rig in between activity on 175 metres.

3ZJ.—New fone rig working fb on 14mc., and has big stick up now.

3UW.—QRL, but time for a spot of DX on 14mc.

3XL.—Given up 200 metres fone es now active on 40 metres. Re-building, and will soon be on 20mx.

3BQ.—Still away at seaside with family at week-ends—ten metre rx down there and condx; vy fb when car QRM permits. Counting on using a diamond ant. shortly after returning.

3RD.—Going to try fone. B.C.L.'s, beware!

3UO.—Messing RAAFWR skeds up and how!

3VW.—QRL QYL. Comes to UO wen QSO 6YL. Who sed coincidence?

3LX.—Hoping to use PP 6L6 modulators on 14mx fone.

3CB.—Active on 40 and 200 metre publicity band in conjunction with YL QRM. Have an inkling for 20mx. key only. A new panel rack under construction, and general upset of shack for more room.

3Cp.—Just finished 8-tube S.S. super.

6LR.—Now 3TQ.

7MF.—Now 3ZS.

3CZ.—Wants S.S. super to overcome vy powerful vy local QRM.

3IW.—Getting many headaches with new 7-tube super!

## WESTERN DISTRICT NOTES.

(By HG).

Conditions are quite good on all bands now, QRM having lifted on 3.5 M.C., and good DX can be heard on all the other three bands. A few

W's can even be heard on 3.5 M.C., but no contact as yet.

3OR.—Paid his final visit to this station for some time, when he came down to take his future bride home. The latter says, "Murray is not to visit any more hams!"

3FA, of Byaduk, after many trials and hardships, has made his debut on the air, and worked a few locals. His signals sound very nice, and should get out well.

3TW.—Has a B class ticket, and is manager of Hamilton's picture theatre. Will be on 7 M.C. phone soon with fine rig.

3TN.—Also of Hamilton, was married recently. We wish he and his YF all the best, and hope it will not be long before he is on the air. He has some nice gear ready for action.

3AC.—Seen out recently with some YL's, which, perhaps, explains why he has not been heard lately.

3NQ.—Heard on mike at 3WE recently while holidaying there with his YL.

3JQ.—Heard regularly on 250 meters.

3DX.—Still entertains the BCL's on this band.

3SE.—Has quite nice phone on 7 M.C.

3OS.—Now in Sydney, but has not taken his gear over.

3HG.—On 3.5 M.C. phone mainly, and finds conditions very good, although the band is not very popular yet.

## MALLEE AND NORTHERN DISTRICT.

(3ZK—3HX.)

Notes this month are very small, as both the above signed have spent

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## HAMS

**E**ARLY Application is advised for the 60-watt Penthodes which were announced in the March issue of "A.R." These valves are a first-grade product, and are made by the 362 Valve Co. Ltd., London.

Further Technical information can be obtained from the January, 1937, issue of "Television and Short-Wave World."

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some of the month in VIM, and consequently out of touch with the doings.

Prior to going away conditions were very bad, ole man static being the main offender, due to unsettled weather conditions.

Congratulations this month go out to Bruce Mann, who at last has succeeded in obtaining his ticket, and probably will be chirping away as 3BM, Quambatook.

3KR, accompanied by Bruce Mann, paid a visit to V1S, where the gang are bemoaning the lost gear. Hi!

3TL is active on at least two bands; has been on 40 mx fone, and, as usual, making a hole. "Vin" his 2nd op. will be heard soon.

3OR is active on fone, and CW in spite of other important matters. Murray is having his speech amp. operated upon.

3EP.—Heard on 80 mx in spite of QRM; spends most of the week on 14 mc., where Ted works a few, looking for WAC.

3BG is now on 40 mx with a 6L6 tri-tet; is adding an E406 as final amp. Roth is also building a new RX.

3AI is rebuilding his rig, and no doubt will be on soon.

3IH is expending a lot of time on the rig; has now a 6A6 exciter link coupled to P.P. 6 P.C.'s. Just put up a 62-ft., pole.

3CE.—Roy is rather inactive, but shortly hopes to get on 20 mx now and again. Has also had a holiday.

3NN.—After a spell, Herb. has made a comeback with fb sigs, due to raising the free end of his antenna.

3TS and 3FF haven't been heard, but are probably waiting to cause a sensation.

3WN has been to the Fire Brigades' Demo.

3HY, at Murchison, has been heard on 40 mx fone.

3ZK and 3HX have both been active and in VIM. With the aid of 3HX's car a few of the gang were visited, and both rigs have certainly been improved since returning home.

## SHORT WAVE GROUP NOTES.

(By O. E. Davies.)

The Group has been very active of late, especially in testing various types and designs of receivers.

All this buzz of excitement came to a head at the meeting on 10th March, when the first of the components for the construction of Superheterodyne at 3WI were delivered.

The Council have voted a sum out of revenue for the completed receiver, and it is being constructed on such lines so that no needless expense will be incurred.

After much deliberation and debate the ultimate design agreed upon was as follows:—An eight-tube Super using metal tubes in the following line up:—1st Det and Separate Osc., 2 stages of I.F., Diode Second Det., B.F.O., 1 Driver stage, and Pentode output.

Features of the receiver are:—Approximate uniform bandspread obtained by use of series plug-in condensers, fitted to the coils. Regenerative mixer, chosen as the most satisfactory manner of improving the signal/noise ratio and gain at the front end of an Amateur Band Super. AVC with on/off switch for optional use. Provision for use and inclusion of a Xtal Filter at a later date. Triple impedance antenna coil; and optional use of either phones or speaker. The whole unit is powered by a supply on a separate chassis.

This Superheterodyne is now in the process of construction, and can be seen at any S.W.G. meeting by those desirous of inspecting same.

Our President, Mr. Stevens, was heard t'other night on 5, using a three-stage M.O.P.A. Good work, Steve.

The rest of the gang are too busy on OUR super to spend much time on anything else at present.

## Queensland Division

At the March meeting much business was attended to in relation to the forthcoming annual meeting, which is to be held on 2nd April; so much, in fact, that the lecture to have been delivered by Mr. F. M. Nolan, VK4FN, on "Modulation," had to be postponed till a later date. At the annual meeting, which promises to be a record-breaker, Mr. G. T. Fisk has consented to present to the Queensland Division the Fisk Trophy. The presentation is to be arranged by a recording through one of the local "B" class stations, owing to Mr. Fisk's absence from Australia on that date.

DX conditions generally have been bad, especially during the BERU contest, although some of the South American fone stations still come through. A change is expected with

the sudden approach of rainy weather and winter.

4VJ is on 20-metre fone with a solid signal, and raising things comparatively easily. A velocity mike starts off the speech end.

4LX has improved his fone quality and modulation depth out of sight, and now sounds first-class fone.

4AP has been on holidays, so it looks as if the BERU Senior has been given the go-by.

4YL and 4UR heard a lot during the BERU Senior, and likewise 4EL, who, it is rumoured, is not satisfied with the performance of his 45-valve with 90 watts input, which cashed in after the key-thump filter blew, raising a large blister on the plate!

4EI.—Just completed six weeks holiday after visiting hams in four States and seeing the Adelaide Test match. The only boys he did not visit were VK6 and VK7. He at present uses a pair of 6P6 tubes in final, the RK20's having gone west.

4ZO returned to his QRA after visiting V1B, and also the Ipswich gang.

4JP has left for U.S.A., where he is looking forward to obtaining some good dope and meeting some of the gang he has contacted from 4JP and 4JX.

4FB is back on the air again, after a slack period, and has a super working well with a recently added RF stage.

4RG works quite a lot with 4HA on 40-metre fone. At the moment 4RG is trying a hand at 20 metres with good results. George's pet subject now is correct loading.

4WT has his 6A6 exciter working, and lands ZL stations quite OK on the doubler. Bill's present worry is trying an 802 as a quadrupler.

4AW turned commercial for a few days, and provided an outside relay to the nearest landline for one of the local "B" class stations.

4JB back from the West, and holidaying at South Coast (Social Notes).

4RY and 4AW took the latter's 56 mc. gear up to 4CG, Toowoomba, the land of the Hill Billies, where they contacted locally, and were successful in hearing 4CG on the return journey at 6 p.m., over a distance of 40 miles.

4NW on again on 40, after very long absence.

4MM has built up a super that hikes at the new QRA, and a good QRA, too.

4RY has a new model car, and has not decided yet just where he will put

the portable gear—over or under the bonnet.

### South Australian Division

(By VK5KL.)

Unfortunately, the two cricket matches mentioned last month did not blossom out in full bloom, owing to the lack of transport, and the ground being unavailable, in the second instance, nevertheless Mr. Vic. Chennel got busy, and by the time these notes appear the combined picnic with the Railway Institute Club 5RI will have been held at the Silver Lake, Mylor, on 21st March. Mr. Alf. Trager's talk on the Inland Mission proved very interesting to members who attended the transmitters' meeting on the 24th February. The V.H.F. Section is progressing favourably, and several new calls will be heard on the 56 M.C. channel in the near future. Already two of the members, 5ZU and 5HP, use xtal controlled transmitters. A scheme is in hand for holding a field day during the Easter holidays.

At the meeting on 10th March Mr. Barbier (Convention delegate) reported on the last Convention held in Sydney.

The 80-metre band is likely to return to its normal self after a few years of old man static. One night recently several VK5's, ZL's, and WIPES were heard at good signal strength. On ten metres conditions are holding well for American contacts. The Europeans seem scarce, but the last two nights (14th) their rigs have been audible around 11 p.m.

### Tasmanian Division

The March meeting of this division lapsed owing to insufficient attendance, so there is no business to chronicle this month. We certainly hope to see a better attendance at future meetings, so look to it, boys, and put in an appearance on the first Tuesday of the month.

7YL.—Out of hospital and on the air. Going to spend her convalescence (and cash) in rebuilding.

7JH.—Piling up new countries to his list on 20 mx. Nearly qso'd an I1 (Italian), but had the misfortune to miss the call at first.

7KV.—Heard on 20 mx fone after many moons of silence. Using series



modulation with fair results on dx, working a VP9.

7HM.—Very active on 40 mx with a 3-stage crystal rig, and has worked several VK's and one W to date.

7PA.—Hard at it in A.R.R.L. contest, and about the only representative in the South in this year's contest.

7DH.—Using half a dozen power supplies in series and countless watts on a poor old 210.

7CT.—Busy servicing BCL sets and YL'TIS.

7SR.—In working order, and worked two W's. We will hear quite a lot of this station, as the Club has several very enthusiastic members.

7BJ.—Breaks the ice occasionally on 40 mx fone. Hasn't broken his neck yet on the gas waggon!

7JB.—Not active in A.R.R.L. CW contest, but hopes to make a noise in the fone section. Busy with 7SR at present.

7AB.—Gone off the deep-end, and is now a married man. Congrats, Doug., om.

7LZ.—Busy installing a Faraday shield between his and 7CL's QRA. QRM a bit hot, I believe.

7CL.—Heard rattling the W's off in the contest.

7RC.—Missed again this year, Ron. Your W friends are getting quite anxious about your inactivity.

Have very little news this month, and would appreciate a few notes from the northern gang as to their activities.

(Continued from Page 17)

W3AIR. — During October and November all continents were heard nearly every day, but with lower signal strength than a year ago. Contacts with U, VO, ZE, YL, YU have brought the countries up to 47 for 28 mc. The J's have been the only code and phone signals readable on the Asiatic beam. On 16th October there were many, but I worked only three new ones (R7 and R6), while they lasted—about 45 minutes. On 10th November, J3FZ was R7, and for a few evenings J2IS phone held the S-metre up to R7-8. 17th November was rather poor, but permitted three contacts. Little or no sign of J's in late November, but VK2GU, who is sometimes up to RS, still affords good dx on phone.

(Continued from Page 18)

3C5 was down in the city for some days, but was so busy we had very

little chance of a yarn. He now has his new transmitter going, and with the 804 PA is putting out a great signal.

3C3 has returned to Callawadda after his holiday in the city.

3D4 is back on regular schedule after rebuilding the whole of his gear. A fire in the shack is not a nice thing to think about, but it is "an ill wind," because Thorburn has had the opportunity, in rebuilding, of bringing his gear right up to date.

3F1 is putting out a grand signal on schedule, but, strange to say, he missed contact with 3Z1 on the first schedule.

We are expecting a visit from 3F3, who is coming to the city this week. 3F2 met him in Camperdown on his way down here.

3A5 is entering the police force. We hope they see he is not on duty on Sunday mornings!

3D5 has just finished a new transmitter, and as 3Z1 is in sight of his antenna he is living in trepidation of the strength of the signal.

3Z1 finds the new QRA even worse than the old one for local QRM. A single 66' wire tuned has relieved the difficulty somewhat, but all hopes are pinned on a doublet, which will be erected as soon as the masts are put up.

From time to time we are compelled to go to press without waiting for all Divisional Notes to arrive, and complaints are received from the Divisions concerned that their notes are not printed.

All Divisions have been notified that copy must reach the Editor not later than the 18th of each month, and, if the magazine is to come off the press on the due date, it is not fair, either to the Editor or the printer, to expect us to wait for late copy.

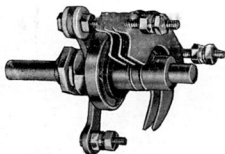
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